

In the Claims:

Claims 1 to 51 (canceled).

1 **52.** (currently amended) A gas sensor for sensing a gas or gas
2 composition at high temperatures, said gas sensor
3 comprising a substrate (1) having a sensor carrier section
4 with a tip (10) and a conductor carrier section (9)
5 connected to said sensor carrier section opposite said tip
6 (10), said sensor carrier section having zones with varying
7 heat dissipations, a gas sensor function layer (4)
8 supported by said sensor carrier section of said substrate
9 (1) next to said tip (10), an electrical heater (6)
10 supported by said sensor carrier section in a position for
11 heating said gas sensor function layer (4), electric power
12 supply conductors (2) supported on said conductor carrier
13 section (9) of said substrate (1) and electrically
14 connected to said electrical heater (6), said electrical
15 heater (6) comprising heater sections having different
16 heating resistance values which depend on a spacing between
17 any particular heater section and said tip (10) of said
18 sensor carrier section, said different heating resistance
19 values generating varying amounts of heat for compensating
20 said varying heat dissipations, said gas sensor further
21 comprising at least one temperature sensing conductor path
22 (12) electrically connected to said electrical heater (6)
23 at least at one contact point, wherein said at least one
24 contact point between said electrical heater (6) and said

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25 at least one temperature sensing conductor path (12) is
26 positioned on said sensor carrier section for measuring an
27 operating temperature of said sensor carrier section to
28 provide a closed loop control signal for said electrical
29 heater to maintain said operating temperature at a minimal
30 temperature gradient throughout said gas sensor function
31 layer, wherein said electrical heater (6) comprises two
32 meandering heater paths (6A, 6B) and an intermediate
33 non-meandering heater portion (6C) positioned next to said
34 tip (10), said intermediate non-meandering heater portion
35 (6C) electrically connecting said two meandering heater
36 paths (6A, 6B) in series with each other, said meandering
37 heater paths (6A, 6B) having amplitudes forming said heater
38 sections, and wherein said amplitudes except a first
39 largest amplitude of said meandering heater paths are
40 diminishing in their size relative to and form said first
41 largest amplitude from said conductor carrier section (9)
42 toward said tip (10) depending on said spacing between any
43 particular heater section formed by a respective amplitude
44 and said tip (10).

1 53. (currently amended) The gas sensor of claim 52, wherein
2 said two meandering heater paths (6A, 6B) of said
3 electrical heater (6) ~~comprises~~ comprise a heater path
4 ~~having a path~~ width (b) along said heater sections, said
5 path width (b) varying depending on said spacing between
6 any particular heater section and said tip (10).

1 54. (currently amended) The gas sensor of claim 52, wherein
2 said gas sensor function layer (4) has a length (L) ~~toward~~
3 between said conductor carrier section and said tip (10)
4 and wherein said at least one contact point is located
5 along said length (L) of said gas sensor function layer (4)
6 and below said gas sensor function layer (4).

1 55. (currently amended) The gas sensor of claim 52, comprising
2 two temperature sensing conductor paths (12A, 12B) and at
3 least two contact points (12A' and 12B') between said two
4 temperature sensing conductor path (12) paths (12A, 12B)
5 and said electrical heater (6) for selecting a different
6 resistance value from at least two different resistance
7 values of said electrical heater (6).

1 56. (currently amended) The gas sensor of claim 52, wherein
2 said gas sensor function layer (4) is secured to one ~~side~~
3 ~~or surface~~ of said sensor carrier section of said substrate
4 (1), and wherein said electrical heater (6) is attached to
5 an opposite ~~side or surface~~ of said sensor carrier section
6 of said substrate (1) in said position for heating said gas
7 sensor function layer (4).

1 57. (previously presented) A gas sensor for sensing a gas or
2 gas composition at high temperatures, said gas sensor
3 comprising a substrate (1) having a sensor carrier section
4 with a tip (10) and a conductor carrier section (9)
5 connected to said sensor carrier section opposite said tip

(10), said sensor carrier section having zones with varying heat dissipations, a gas sensor function layer (4) supported by said sensor carrier section of said substrate (1) next to said tip (10), an electrical heater (6) supported by said sensor carrier section in a position for heating said gas sensor function layer (4), electric power supply conductors (2) supported on said conductor carrier section (9) of said substrate (1) and electrically connected to said electrical heater (6), said electrical heater (6) comprising heater sections having different heating resistance values which depend on a spacing between any particular heater section and said tip (10) of said sensor carrier section, said different heating resistance values generating varying amounts of heat for compensating said varying heat dissipations, said gas sensor further comprising at least one temperature sensing conductor path (12) electrically connected to said electrical heater (6) at least at one contact point, wherein said at least one contact point between said electrical heater (6) and said at least one temperature sensing conductor path (12) is positioned on said sensor carrier section for measuring an operating temperature of said sensor carrier section to provide a closed loop control signal for said electrical heater to maintain said operating temperature at a minimal temperature gradient throughout said gas sensor function layer, wherein said electrical heater (6) comprises a heater path having a path length along said heater sections and a path width (b), wherein said path length and said

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34 path width (b) both vary depending on said spacing between
35 any particular heater section and said tip (10), wherein
36 said heater path length diminishes from heater section to
37 heater section toward said tip (10), and wherein said path
38 width (b) increases from heater section to heater section
39 toward said tip (10).

1 58. (currently amended) The gas sensor of claim 57, wherein
2 said gas sensor function layer (4) is secured to one ~~side~~
3 ~~or~~ surface of said sensor carrier section of said substrate
4 (1), and wherein said electrical heater (6) is attached to
5 an opposite ~~side or~~ surface of said same sensor carrier
6 section of said substrate (1) in said position for heating
7 said gas sensor function layer (4).

1 59. (currently amended) The gas sensor of claim 57, wherein
2 said gas sensor function layer (4) has a length (L) ~~toward~~
3 between said conductor carrier section and said tip (10)
4 and wherein said at least one contact point is located
5 along said length (L) of said gas sensor function layer (4)
6 and below said gas sensor function layer (4).

1 60. (currently amended) The gas sensor of claim 57, comprising
2 two temperature sensing conductor paths (12A, 12B) and at
3 least two contact points (12A' and 12B') between said two
4 temperature sensing conductor path (12) paths (12A, 12B)
5 and said electrical heater (6) for selecting a different

6 resistance value from at least two such different
7 resistance values of said electrical heater (6).

1 61. (currently amended) A gas sensor for sensing a gas or gas
2 composition at high temperatures, said gas sensor
3 comprising a substrate (1) having a sensor carrier section
4 with a tip (10) and a conductor carrier section (9)
5 connected to said sensor carrier section opposite said tip
6 (10), said sensor carrier section having zones with varying
7 heat dissipations, a gas sensor function layer (4)
8 supported by said sensor carrier section of said substrate
9 (1) next to said tip (10), an electrical heater (6)
10 supported by said sensor carrier section in a position for
11 heating said gas sensor function layer (4), electric power
12 supply conductors (2) supported on said conductor carrier
13 section (9) of said substrate (1) and electrically
14 connected to said electrical heater (6), said electrical
15 heater (6) comprising heater sections having different
16 heating resistance values which depend on a spacing between
17 any particular heater section and said tip (10) of said
18 sensor carrier section, said different heating resistance
19 values generating varying amounts of heat for compensating
20 said varying heat dissipations, said gas sensor further
21 comprising two temperature sensing conductor paths (12A,
22 12B) electrically connected to said electrical heater (6)
23 at two respective contact points, positioned on said sensor
24 carrier section for measuring an operating temperature of
25 said sensor carrier section to provide a closed loop
26 control signal for said electrical heater to maintain said

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operating temperature at a minimal temperature gradient throughout said gas sensor function layer, and wherein said electrical heater (6) comprises an intermediate non-meandering heater portion (6C) and at least two meandering heater paths (6A, 6B) electrically connected in series with each other by said intermediate non-meandering heater portion (6C) to form an electrical heater series connection, wherein said two respective temperature sensing conductor paths (12A, 12B) are connected to said electrical heater series connection by at said two respective contact points, (12A', 12B'), and wherein said two contact points (12A', 12B') are spaced from each other along said electrical heater series connection at a predetermined spacing between said two contact points.

62. (currently amended) The gas sensor of claim 61, wherein said gas sensor function layer (4) is secured to one ~~side~~ or surface of said sensor carrier section of said substrate (1), and wherein said electrical heater (6) is attached to an opposite ~~side~~ or surface of said same sensor carrier section of said substrate (1) in said position for heating said gas sensor function layer (4).

63. (currently amended) The gas sensor of claim ~~60~~, 61, wherein said electrical heater (6) comprises a heater path having a path width (b) along said heater sections, said path width (b) varying depending on said spacing between any particular heater section and said tip (10).

1 64. (currently amended) The gas sensor of claim ~~60~~, 61, wherein
2 said gas sensor function layer (4) has a length (L) ~~toward~~
3 between said conductor carrier section and said tip (10)
4 and wherein at least one contact point of said two contact
5 points is located along said length (L) of said gas sensor
6 function layer (4) and below said gas sensor function layer
7 (4).

1 65. (currently amended) A gas sensor for sensing a gas or a gas
2 composition at high temperatures, said gas sensor
3 comprising a substrate (1) including a sensor carrier
4 section with a tip (10) and a gas sensor function layer (4)
5 supported by said sensor carrier section, an electrical
6 heater (6) supported by said sensor carrier section, said
7 electrical heater comprising at least one meandering heater
8 path including amplitudes forming heater sections, wherein
9 a first heater section has the largest amplitude and each
10 heater section having has a different heating resistance
11 value which depends on a spacing between said tip (10) and
12 a respective heater section of said heater sections, and
13 wherein a second and further amplitudes of said amplitudes
14 forming said heater sections diminish toward said tip (10)
15 relative to said largest amplitude of said first heater
16 section for maintaining an operating temperature of said
17 sensor carrier section at a minimal temperature gradient
18 throughout said gas sensor function layer (4).

1 66. (previously presented) The gas sensor of claim 65, further
2 comprising at least one temperature sensing conductor path

(12) electrically connected to said electrical heater (6) for measuring said operating temperature to provide a control signal for controlling said operating temperature.

67. (currently amended) The gas sensor of claim 65, wherein said gas sensor function layer (4) is secured to one side or surface of said sensor carrier section of said substrate (1), and wherein said electrical heater (6) is attached to an opposite side or surface of said sensor carrier section of said substrate (1) in said position for heating said gas sensor function layer (4).

68. (currently amended) A gas sensor for sensing a gas or a gas composition at high temperatures, said gas sensor comprising a substrate (1) including a sensor carrier section with a tip (10) and a gas sensor function layer (4) supported by said sensor carrier section, an electrical heater (6) supported by said sensor carrier section, said electrical heater comprising at least one meandering heater path including amplitudes forming heater sections, each heater section having a different heating resistance value which depends on a spacing between said tip (10) and a respective heater section of said heater sections, wherein said heater sections form at least two groups of heater sections, and wherein second and further amplitudes of said amplitudes forming each group of said heater sections diminish toward said tip (10) relative to a largest amplitude in each group of heater sections for maintaining an operating temperature of said sensor carrier section at

18 a minimal temperature gradient throughout said gas sensor
19 function layer (4).

[RESPONSE CONTINUES ON NEXT PAGE]

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